

EXPLANATION OF TPP TERMS AND SYMBOLS

The discussions and examples in this section will be based primarily on the IFR (Instrument Flight Rule) Terminal Procedures Publication (TPP). Other IFR products use similar symbols in various colors (see Section 2 of this guide). The publication legends list aeronautical symbols with a brief description of what each symbol depicts. This section will provide a more detailed discussion of some of the symbols and how they are used on TPP charts.

NACO charts are prepared in accordance with specifications of the Interagency Air Cartographic Committee (IACC), which are approved by representatives of the Federal Aviation Administration, and the Department of Defense. Some information on these charts may only apply to military pilots.

PILOT BRIEFING INFORMATION

The pilot briefing information format consists of three horizontal rows of boxed procedure-specific information along the top edge of the chart. Altitudes, fre-

CARLSBAD, CALIFORNIA				
APP CRS 245°	Rwy Idg TDZE Apt Elev 4600 326 328	RNAV (GPS) RWY 24 CARLSBAD/MC CLELLAN-PALOMAR (CRQ)		
Baro-VNAV NA below -15°C (5°F). Inoperative table does not apply to LNAV CAT A. For inoperative MALSR increase LNAV CAT B visibility to 1 1/2.		MALSR 	MISSED APPROACH: Climb to 2000 via 245° course to IBUGE WP and hold.	
ATIS* 120.15	SOCAL APP CON 127.3 323.0	PALOMAR TOWER* 118.6 (CTAF) 392.0	GND CON 121.8	CLNC DEL 134.85

quencies and channel, course and elevation values (except HATs and HAAs) are charted in bold type. The top row contains the primary procedure navigation information, final approach course, landing distance available, touchdown zone and airport elevations. The middle row contains procedure notes and limitations, icons indicating if nonstandard alternate and/or take-off minimums apply, approach lighting symbology, and the full text description of the missed approach procedure. The bottom row contains air to ground communication facilities and frequencies in the order in which they are used during an approach with the tower frequency box bolded.

NOTE: The **W** symbol indicates that outages of the WAAS vertical guidance may occur daily at this location due to initial system limitations. WAAS NOTAMs for vertical outages are not provided for this approach. Use LNAV minima for flight planning at these locations, whether as a destination or alternate. For flight operations at these locations, when the WAAS avionics indicate that LNAV/VNAV or LPV service is available, then vertical guidance may be used to complete the approach using the displayed level of service. Should an outage occur during the procedure, reversion to LNAV minima may be required. As the WAAS coverage is expanded, the **W** will be removed.

MISSED APPROACH ICONS

In addition to the full text description of the missed approach procedure contained in the notes section of the middle-briefing strip, the steps are also charted as boxed icons in the chart profile view. These



icons provide simple-to-interpret instructions, such as

direction of initial turn, next heading and/or course, next altitude, etc.

RNAV CHART MINIMA

RNAV instrument approach procedure charts will now incorporate all types of approaches using Area Navigation systems, both ground based and satellite based. Below is an explanation of the RNAV minima.

The standard format for RNAV minima (and landing minima) is as shown below. RNAV minima are

CATEGORY	A	B	C	D	E
LPV DA	296/40		250	(300 - 3/4)	
LNAV/VNAV DA	500/50		454 (500-1)		
LNAV MDA	640/40	594 (600-3/4)	640/50 594 (600-1)	640/60 594 (600-1/4)	640-1 1/2 594 (600-1/2)
CIRCLING	640-1 1/2		594 (600-1 1/2)		640-2 594 (600-2)

dependent on navigational equipment capability, as stated in the applicable AFM or AFMS, or other FAA approved document, and as outlined below.

GLS (Global Navigation Satellite System (GNSS) Landing System)

The GLS (NA) Minima line will be removed from the existing RNAV (GPS) approach charts when LPV minima is published.

LPV (An Approach Procedure with Vertical Guidance (APV) based on WAAS lateral and vertical guidance)

Must have WAAS (Wide Area Augmentation System) avionics approved for LPV approach.

LNAV/VNAV (Lateral Navigation/Vertical Navigation)

Must have either:

- WAAS avionics approved for LNAV/VNAV approach, or
- A certified Baro-VNAV system with an IFR approach GPS, or
- A certified Baro-VNAV system with an IFR approach approved WAAS, or
- An approach certified RNP-0.3 system..

Other RNAV approach systems require special approval.

NOTES:

1. LNAV/VNAV minima not applicable for Baro-VNAV equipment if chart is annotated "Baro-VNAV NA" or when below the minimum published temperature, e.g., Baro-VNAV NA below 17 C (2 F).

2. DME/DME based RNP-.03 systems may be used only when a chart note indicates DME/DME availability; e.g., "DME/DME RNP-0.3 Authorized." Specific DME facilities may be required; e.g., "DME/DME RNP-0.3 Authorized, ABC, XYZ required."

LNAV (Lateral Navigation)

Must have IFR approach approved GPS, WAAS, or RNP-0.3 system. Other RNAV systems require special approval.

NOTE: DME/DME RNP-0.3 systems may be used only when a chart note indicates DME/DME availability; e.g., "DME/DME RNP-0.3 Authorized." Specific DME facilities may be required; e.g., "DME/DME RNP-0.3 Authorized. ABC, XYZ required."

TERMINAL ARRIVAL AREAS (TAAs)

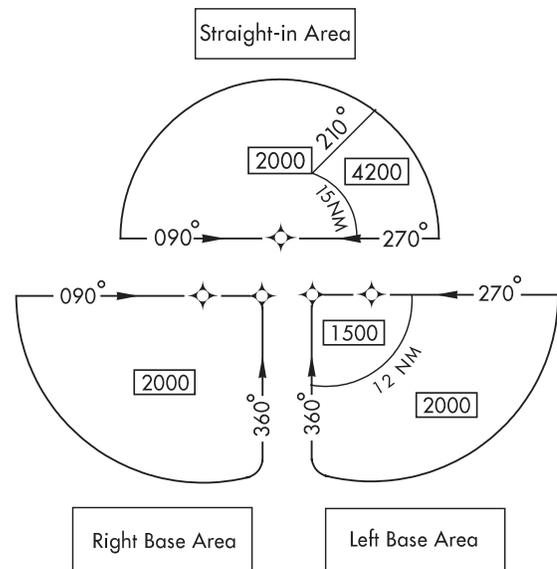
The objective of the Terminal Arrival Area (TAA) is to provide a seamless transition from the enroute structure to the terminal environment for arriving aircraft equipped with Flight Management System (FMS) and/or Global Positioning System (GPS) navigational equipment. The underlying instrument approach procedure is an area navigation (RNAV) procedure. The TAA contains within it a "T" structure that normally provides for a No Procedure Turn (NoPT) for aircraft using the approach. The TAA provides the pilot and air traffic controller with a very efficient method for routing traffic into the terminal environment with little required air traffic control interface, and with minimum altitudes depicted that provide standard obstacle clearance compatible with the instrument procedure associated with it. The TAA will not be found on all RNAV procedures, particularly in areas of heavy concentration of air traffic. When the TAA is published, it replaces the MSA for that approach procedure. TAAs may appear on current and new format GPS and RNAV IAP charts.

The standard TAA consists of three areas defined by the extension of the Initial Approach Fix (IAF) legs and the intermediate segment course. These areas are called the straight-in, left-base, and the right-base areas. TAA area lateral boundaries are identified by magnetic courses TO the IAF. The straight-in area can further be divided into pie-shaped sectors with the boundaries identified by magnetic courses TO the IF/IAF, and many contain stepdown sections defined by arcs based on RNAV distances (DME or ATD) from the IF/IAF. The right/left-base areas can only be subdivided using arcs based on RNAV distances from the IAF's for those areas.

Straight-In Area: The straight-in area is defined by a semi-circle with a 30 NM radius centered on and extending outward from the IF/IAF. The altitude shown

within the straight-in area icon provides minimum IFR obstacle clearance

Base Areas: the left and right base areas are bounded by the straight-in TAA and the extension of the intermediate segment course. The base areas are defined by a 30 NM radius centered on the IAF on either side of the IF/IAF. The IF/IAF is shown in the base area icons without its name. The altitude shown within the base area icons provides minimum IFR obstacle clearance.



Minimum MSL altitudes are charted within each of these defined/subdivisions that provide at least 1,000 feet of obstacle clearance, or more as necessary in mountainous areas

NOTE: Additional information for the TAAs can be found in the Aeronautical Information Manual (AIM) Para 5-4-5-d.

ALTERNATE MINIMUMS

When an alternate airport is required, standard IFR alternate minimums apply. Precision approach procedures require a 600-foot ceiling and 2 statute miles visibility; nonprecision approaches require an 800-foot ceiling and 2 statute miles visibility. When a **▲** appears in the Notes section of the approach chart, it indicates non-standard IFR alternate minimums exist for the airport. This information is found in Section E of the TPP. If **▲_{NA}** appears, alternate minimums are not authorized due to unmonitored facility or absence of weather reporting service. Civil pilots see FAR 91.

Alternate Take-Off Minimums and (Obstacle) Departure Procedures

When a **▼** appears in the Notes section, it signifies the airport has nonstandard IFR takeoff minimums.

CIVIL USERS NOTE: FAR 91 prescribes standard take-off rules and establishes take-off minimums for certain operators as follows: (1) Aircraft having two engines or less - one statute mile. (2) Aircraft having more than two engines - one-half statute mile. These standard minima apply in the absence of any different minima listed in Section C of the TPP.

ALL USERS: Airports that have Departure Procedures (DPs) designed specifically to assist pilots in avoiding obstacles during the climb to the minimum enroute altitude, and/or airports that have civil IFR take-off minimums other than standard, are listed in Section C of the TPP by city. Take-off Minimums and Departure Procedures apply to all runways unless otherwise specified. Altitudes, unless otherwise indicated, are minimum altitudes in MSL.

DPs specifically designed for obstacle avoidance may be described in Section C of the TPP in text or published as a graphic procedure. Its name will be listed, and it can be found in either the TPPs (civil) or a separate Departure Procedure volume (military), as appropriate. Users will recognize graphic obstacle DPs by the word "(OBSTACLE)" included in the procedure title; e.g., TETON TWO (OBSTACLE). If not assigned another DP or radar vector by ATC, this procedure may be flown to ensure obstacle clearance.

Graphic DPs designed by ATC to standardize traffic flows, ensure aircraft separation and enhance capacity are referred to as "Standard Instrument Departures (SIDs)". SIDs also provide obstacle clearance and are published under the appropriate airport section. ATC clearance must be received prior to flying a SID.

NOTE: Graphic Departure Procedures that have been designed primarily to assist Air Traffic Control in providing air traffic separation (as well as providing obstacle clearance) are usually assigned by name in an ATC clearance and are not listed by name in Section C of the TPP.

RNAV Departure Procedures (DP) and Standard Terminal Arrival Routes (STAR)

RNAV DPs and STARs are being developed to support a more efficient traffic flow and further National Airspace System (NAS) capacity. These procedures will be flown only by /E, /F, and /G aircraft, i.e., those with onboard databases. These procedures will extend over a larger geographic area to allow ATC spacing and sequencing to occur en route. In order to reduce the number of pages required to depict these longer procedures, changes to the graphic depictions and textual data are necessary.

NAVAID boxes will be removed and identified with only the name, the three-letter ident and the applicable symbol. Waypoints will be identified with waypoint symbol and five letter name. Waypoints that overlay NAVAIDs will be depicted only as NAVAIDs, not as a waypoint. A single graphic will be used when possible; how-

ever, if not feasible, the common portion of the procedure will be shown on a single page with transitions contained on subsequent pages. Subsequent pages will be subtitled with the transition area, i.e., CHEZZ ONE DEPARTURE Northeast Transitions, or JHAWK TWO ARRIVAL South Transitions. Text remarks that apply to the entire procedure, or all transitions, will be charted on the page that contains the common point and common portion of the procedure. Text remarks that apply to a specific transition will be charted on the page that contains that transition. Transition text will not include a description of the route but will instead state expectations for altitudes, clearances, FL restrictions, aircraft constraints, specific airport arrival use, etc.

RNAV Departure Procedures (DP) and Standard Terminal Arrival Routes (STAR) Legs

Due to the variations in the development, documentation, charting and database coding of RNAV Departure Procedures (DPs), it has become necessary to chart RNAV legs with specific information based on their type. This data depiction will provide pilots with a clearer indication of the type of leg the aircraft will be flying and the ensuing flight profile.

Heading - no waypoints shown, "hdg" charted after degrees (i.e., 330^o hdg), no mileage shown.

Direct - waypoint at termination of leg, no course shown, no mileage shown.

Course - waypoint at termination of leg, course shown, mileage shown only if first leg upon departure.

Track - waypoints at beginning and termination of leg, course shown, mileage shown.

Leg mileages will be listed differently based on certain criteria. Mileages on Course and Track legs will be shown to the nearest one-tenth of a NM when all three of the following conditions are met:

Leg termination is 30 NM or less to the Airport Reference Point (ARP) (for STARs, leg origination must be 30 NM or less from the ARP for the primary airport) and,

leg segment is less than 30 NM and,

leg segment is not part of the En route structure.

In all other instances, leg mileages will be rounded off to the nearest whole NM, as they are currently.

Instrument Approach Chart

Pilot Briefing Information

JACKSONVILLE, FLORIDA AL-5570 (FAA)

RNAV (GPS) RWY 13
JACKSONVILLE INTL (JAX)

APP CRS 133°	Rwy Idg 7701	TDZE 27	Apt Elev 30
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▲ NA Baro-VNAV not authorized below -15°C (5°F). GPS or RNP-0.3 Required. DME/DME RNP-0.3 not authorized.

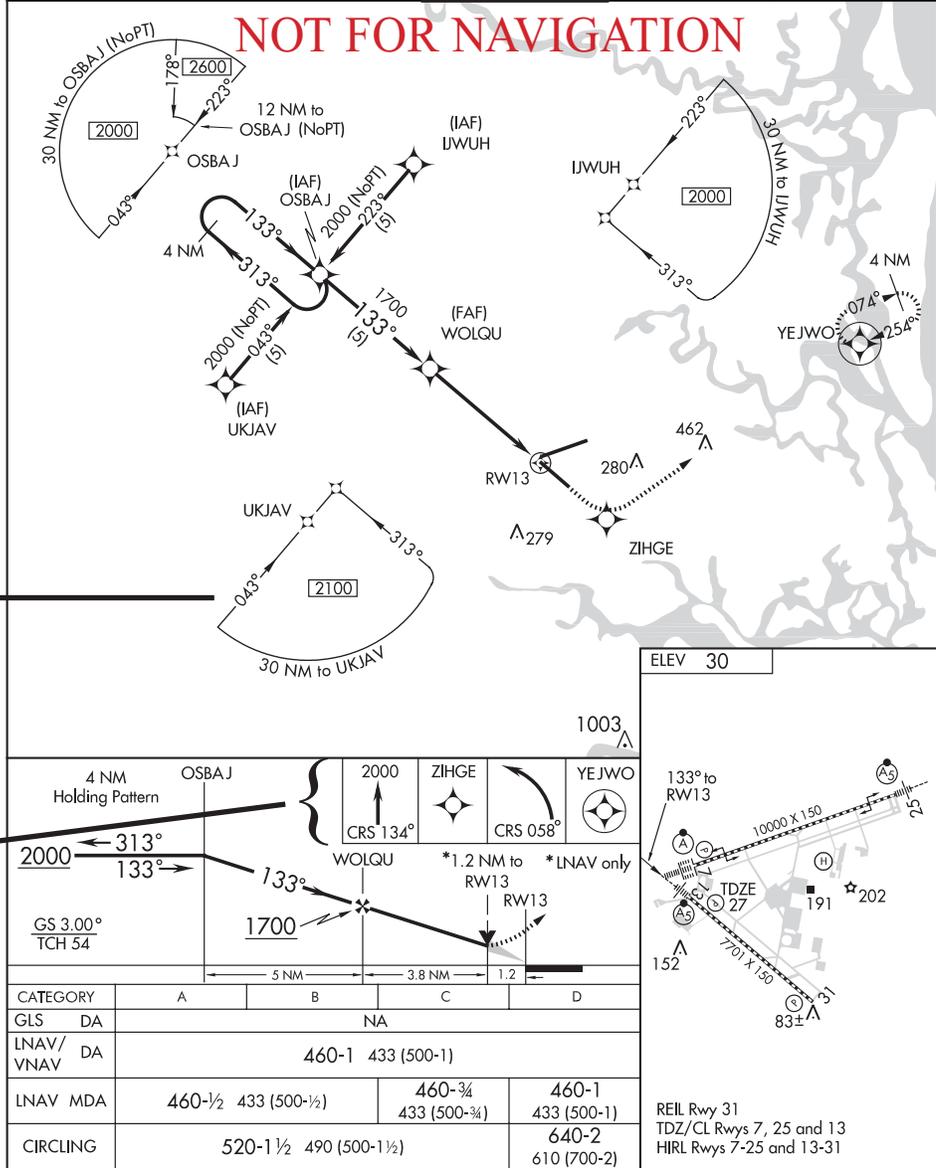
MALS R MISSED APPROACH: Climb to 2000 via course 134° to ZIHGE WP then left turn via course 058° to YEJWO WP and hold.

ATIS 125.85	JACKSONVILLE APP CON 119.0 335.6	JACKSONVILLE TOWER 118.3 317.7	GND CON 121.9 348.6	CLNC DEL 119.5 290.275
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Terminal Arrival Areas (TAAs)

Missed Approach Icons

RNAV Minima



JACKSONVILLE, FLORIDA Orig 02164

30°30'N-81°41'W

JACKSONVILLE INTL (JAX)
RNAV (GPS) RWY 13

Terrain will be depicted in the planview portion of all IAPs at airports that meet the following criteria:

- If the terrain within the planview exceeds 4,000 feet above the airport elevation, or
- If the terrain within a 6.0 nautical mile radius of the Airport Reference Point (ARP) rises to at least 2,000 feet above the airport elevation.

Approximately 240 airports throughout the US currently meet the above criteria.

The initial contour value (lowest elevation) will be at least 500' but no more than 1000' above the airport elevation. The initial contour value may be less than 500' above the airport elevation if needed to depict a rise in terrain close to the runway end. The next contour value depicted will be at a 1000' increment (e.g., 1000'/2000'/3000', etc., NOT 1500'/2500'/3500', etc.). Subsequent contour intervals will be constant and at the most suitable intervals, 1000' or 2000', to adequately depict the rising terrain.

